

investigations by Hesse, Perlich, and others, tended to confirm this doubt. With the hope of arriving at a definite conclusion in the matter Waldstein and Weber¹ have instituted a series of experiments with trypsin, studying its action, among other things, on the peripheral nerves and the central nervous system. They arrive at the conclusion that the neurokeratin of Ewald and Kühne is an artificial product formed by the breaking up of myelin by the reagents employed, and that the inner and outer myelinic sheaths and their associated net-work do not exist in the nerves in their natural condition.

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b.—PHYSIOLOGY OF THE NERVOUS SYSTEM.

GUACHAMACA.—This drug comes from Orinoco, Venezuela, and experiments were made by Dr. Schiffer with the extract. The plant belongs to the apocynaceæ, a family which has furnished many therapeutic and toxic preparations. The chemical and physical relations of this drug resemble those of curare, and it was found that a great similarity existed in their physiological peculiarities. When given to a rabbit it paralyzed the motor

¹ Waldstein and Weber: Études histochemiques sur les tubes nerveux a myéline.—*Arch. de phys. nor. et path.*, July, 1882.

nerves, but it did not interfere with the respiration like curare does. The heart continued beating, as usual with curare. It differs from curare as follows : 1. This poison paralyzes for a time the voluntary muscles, whilst the respiration goes on normally, or nearly so. 2. It appears in the first stage to act on the nerve centres, whilst curare affects them late in the state of poisoning, or not at all. 3. Curare by the stomach does not affect the organism in colossal doses, whilst guachamaca does in moderate ones. It increases the salivary secretion and the peristalsis of the intestinal canal. It has also a slight narcotic action.—*Deutsche medicinische Wochenschrift*, No. 28, 1882.

BUCCO-LABIAL CIRCULATION.—Dastre and Morat state that the cervical sympathetic contains vaso-dilator fibres going to the bucco-facial region. It was also found that certain excitations were able to normally throw these nerves into activity. It was found that the nerves of general sensibility, and especially the pneumogastric, conveyed irritations calling the vaso-dilator centres into activity. Of the branches of the pneumogastric the pulmonary were found to be the most active agents in calling out vaso-dilator phenomena. In this manner they explain the facial blush of pneumonia.

They made experiments to determine the reflex action of the depressor nerve of Ludwig and Cyon. They operated on a curarized rabbit, prepared the depressor and divided it. The section of the nerve had no influence on the bucco-labial circulation. If, however, the cephalic end was excited, there was a paleness and evident narrowing of the capillaries. Hence we have with the depressor a vaso-constrictor action, and not a vaso-dilator reflex. The rôle of the depressor is not a general vascular dilation, since at the same time that the vessels of the abdominal viscera are dilated those of the bucco-facial region are contracted. Their experiments also show the remarkable antagonism which exists between the intestinal circulation and that of the skin, the vessels of the one dilating whilst the others are contracting.—*Gazette des Hôpitaux*, No. 71, 1882.

SECTION OF THE SPINAL CORD.—Grehant and Quinquad have made a series of experiments upon the phenomena consecutive to section of the cord in dogs. As a result of the section the temperature falls from 40° to 25°. They investigated the relation

existing between the fall of temperature and the exhalation of carbonic acid. It was found that a very close relation existed between the two phenomena.—*Gazette des Hôpitaux*, No. 86, 1882.

THE PHRENIC NERVE.—Henocque and Eloy have made experiments upon the phrenic nerve, to determine the action of each one of the roots that go to form the nerve. In the guinea-pig they found that section of the upper roots of these nerves increased the muscular contraction of the diaphragm and exaggerated the activity of respiration, whilst section of the inferior branches enfeebls the diaphragm and the respiratory rhythm.—*Le Progrès Médical*, No. 31, 1882.

REFLEX MOVEMENTS UNDER STRYCHNIA.—Dr. C. L. Walton has made some experiments with frogs under the influence of strychnia, and his conclusions are as follows: Any stimulus capable of producing a reflex contraction in the strychnized frog produces a maximal contraction, provided a certain period of time has elapsed since the preceding stimulation. The period which must elapse varies with the degree of poisoning, being only a few seconds when the frog is strongly poisoned. During this period the contraction is dependent on the strength of the stimulus, being absolutely relative to it at the beginning of the period and becoming gradually less so as the period advances. All these contractions are of the nature of a general convulsion. Stimuli separately inadequate to produce a reflex movement will not produce one when repeated; that is, there is no "summation of stimuli." This is one of the most striking respects in which the poisoned differs from the normal cord. The minimal stimulus capable of producing a reflex movement becomes less and less as the poisoning increases, and the contractions produced by these stimuli become meanwhile greater. The motor and sensory nerves are unaffected by strychnia beyond the wearying due to repeated activity. Invertebrates, as far as experimented on, are not susceptible of strychnia-poisoning. Death from strychnia, though probably due primarily to an alteration in the central nervous system, is greatly influenced by the amount of convulsive action; the frog which is kept quiet as possible remaining alive much longer than the one which is constantly stimulated, the degree of poisoning being the same in both cases.—*Foster's Journal of Physiology*, vol. iii, Nos. 5 and 6.

ABDOMINAL STRAINING.—Guillebeau and Luchsinger have been making experiments to determine the centre which sets the abdominal muscles into activity. They made experiments upon young cats, dogs, and rabbits. The spinal cord was divided high up, and artificial respiration set up. Then the abdomen was opened, and the left sympathetic sought, prepared, and divided. It was put on the electrode of an induction apparatus. When this nerve was irritated the diaphragm descended, the abdominal muscles contracted, and the thorax was in the position of expiration. Mechanical irritation acted similarly. It is also possible from the spinal cord alone, by irritation of a sensory nerve of the abdominal cavity, to reflexly call out the mechanism of straining. These experiments explain the contracted abdominal muscles, when great pain exists in the abdominal cavity.—*Pflüger's Archiv*, 1882, 1 and 2 Heft.

CHEMICAL IRRITATION OF SMOOTH MUSCLE.—Nothnagel has made experiments upon this point. The abdomen of a rabbit was opened in a bath of chloride of sodium, with a constant temperature of 38° . The animals were narcotized by the subcutaneous injection of ether. The salts were used in substance and placed in circumscribed places on the external surface of the bowel. When a potash-salt was placed on a spot of either the small or large bowel, there ensued a strong muscular contraction, which remained confined to the place of application, and lasted from two to five minutes. The application of a soda-salt generated a contraction which extended over several centimetres, and always toward the pylorus, and lasted five to thirty seconds. Ammonia-salts act like soda-salts. The experiments succeed when the nerves going to the bowel are completely divided.—*Centralblatt für die medicinischen Wissenschaften*, No. 37, 1882.

ACTION OF MORPHIA ON THE INTESTINE.—Nothnagel has also made experiments upon this subject. When in a rabbit the bowel was set into activity by a soda-salt, he injected .01-.03 gramme of morphia. If now the bowel was again tested by a soda-salt, then no ascending contraction ensued, but only a contraction at the point of application, as normally ensues with a potash-salt. If, however, he injected more morphia—.05 or .10 gramme—then the application of the soda-salt caused an ascending contraction. The small dose of morphia caused an irritation of nerve-fibres which

inhibited the nervous apparatus, generating the ascending contraction on the application of soda-salts. Larger doses of morphia paralyze the inhibitory nerves. The inhibitory action of morphia is conveyed chiefly through the splanchnics.

The constipating effect of morphia is partly due to this action of inhibition, and partly to diminished secretion and lessened sensibility of sensory nerves. Morphia and digitalis have a corresponding action on inhibitory apparatuses: thus, digitalis stimulates the vagus in small doses, whilst large doses paralyze it; morphia stimulates in small doses the splanchnicus, and in large doses paralyzes it.—*Centralblatt für med. Wiss.*, No. 36, 1882.

FUNCTIONS OF PARIETAL LOBES.—Goltz, by experiments upon dogs, has proven that extensive and profound destruction of both parietal lobes causes not only diminished intelligence, but also a remarkable change in their disposition. Harmless and good-natured dogs, after this operation, become surly, quarrelsome, and violent.—*Pflüger's Archiv*, 1882, Band 28, Heft 11 and 12.

REFLEXES FROM MUCOUS MEMBRANES.—W. J. Belfield has made a series of experiments upon this point. He used dogs, and irritated the vagina and rectum. The animals were curarized, and artificial respiration was kept up. By irritating the rectum or vagina mechanically, he saw a considerable depression of the arterial tension. If the splanchnics are divided above the diaphragm, then irritation of these parts is without effect. He holds that the splanchnics carry the depressing impulses to the blood-vessels, allowing them to dilate, and nerves coming from the lumbar segment of the spinal cord convey the impulses to the nerve-centres.—*DuBois' Archiv*, 1882, 3 and 4 Heft.

THE INFLUENCE OF TETANIZING IRRITATIONS UPON THE FORM AND SIZE OF THE TETANIC CURVE.—C. Bohr has gone into this subject in a thorough manner. He used frogs and toads. His results are as follows:

1. Where, after the tetanus, there is no lasting contraction (Tiegel's contracture), the form of the tetanic curve is independent of the frequency and strength of the irritations.
2. The greatest height to which the tetanic curve can attain, other things being equal, is independent of the frequency of the irritation.

3. The height to which the tetanic curve may reach, within certain limits, increases with the strength of separate irritations.—*DuBois' Archiv*, 1882, Heft 3 and 4.

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c.—GENERAL PATHOLOGY OF THE MENTAL SYSTEM.

THE RELATION AND PATHOLOGY OF THE PACCHIONIAN FORMATIONS AND THE SPACES BESIDE THE SINUSES OF THE DURA MATER.—W. Browning, M.D., Resident Physician to the German Hospital, New York, in an elaborate article in the *Amer. Jour. of Med. Sci.*, October, says: The Pacchionian granulations are small nodular growths of the (cerebral) arachnoidea. They are usually more or less clustered, and the larger ones are, as a rule, pedunculated. Luschka claims, it is true, that they can originate from the inner surface of the dura mater, but Ludwig Meyer gives a series of observations to the effect, that if the dura be removed with proper care, it is always possible to see the pedicle by which the granulations which have grown into the dura are still connected with the arachnoidea. They can originate as well from the arachnoidea where it bridges the sulci, as where it lies on the crest of the gyri. The conclusion of Meyer, that the granulations originate wholly from the cerebral arachnoidea, is surely correct. He also states that in the normal condition they are covered by an epithelial layer like the arachnoidea itself. On the authority of Key and Retzius it is stated that these granulations fill to little vesicles, on injecting the subarachnoid space. A remark of Meyer tends to confirm this: "The collective villi are very often infiltrated with serum when there is marked œdema. They can be easily reduced by pressure or incision, like œdema of the arachnoid itself. These facts speak for the granulations being pouches of the arachnoidea." Key and Retzius state further that the cerebro-spinal fluid makes its way from the subarachnoid space, through the Pacchionian granulations, into the venous spaces of the dura, and by ways as yet unknown into the lymph-spaces at the base of the brain, and those of the nasal mucous membrane.

It has long been known that the Pacchionian granulations are limited in their occurrence to certain parts of the arachnoidea; in greatest frequency, it is true, along the side of the longitudinal sinus, but, as especially emphasized by Meyer, also occurring in the middle or temporal fossa, over the anterior lobes, often 3, and